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THE FIRST MOLANNID CADDISFLY FROM CEYLON, *MOLANNA TAPROBANE*, NEW SPECIES (TRICHOPTERA, MOLANNIDAE)

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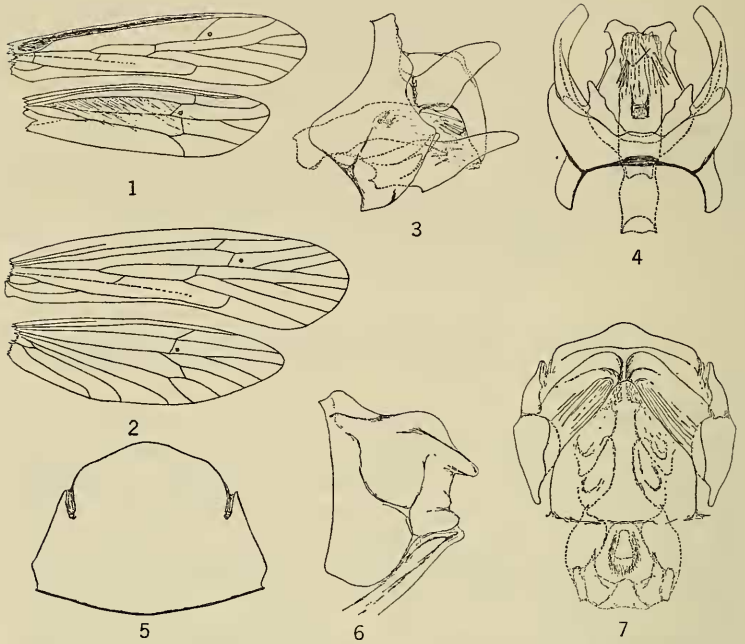
The caddisfly family Molannidae is a rather small one, containing only three genera and some two dozen species. The family is primarily north temperate in distribution, although one species is known from as far south as the Celebes. The few forms described from further south (South Africa and Australia) and originally placed in the Molannidae, are in fact, not molannids (Riek 1968, Marlier 1962). Wiggins (1968) treated the Asian Molannidae, especially those of Japan and the Indian subcontinent. He did find one species, *Molanna paramoesta* Wiggins, widespread over India as far south as the states of Kerala and Madras, but did not record any species from Ceylon.

The only reference to a molannid from Ceylon is in Hagen (1858), wherein *Molanna mixta* was described from Ramboda. Recent study of the types of *mixta* has shown that the species is in reality a species of *Marilia* and thus belongs in the family Odontoceridae (Schmid 1958).

I was, therefore, somewhat surprised and excited when I discovered larvae of a molannid in a small pool on the Horton Plains of Ceylon in October of 1970. Considerable effort was taken to supplement the initial collection of larvae, with the result that several pupal exuviae and two adult males were taken at the locality. Subsequently, larvae and adults were taken at a second locality in Pattipola. In 1972 Dr. Hans Malicky wrote that he had a female of a species of *Molanna* in the collection made by Professor Starmühlner that he was



FIGS. 1–7. *Molanna taprobane*, new species: 1, male venation; 2, female, venation; 3, male genitalia, lateral; 4, male genitalia, ventral; 5, female tenth tergum dorsal; 6, female genitalia, lateral; 7, female genitalia, ventral.

studying. Dr. Malicky very generously lent this specimen to me for inclusion in this paper. All these materials appear to be referable to a single species of *Molanna* that is herewith described.

Molanna taprobane, new species

This species is very distinctive and does not show any close relationship to any other known species in the genus. The reflexed costal cell of the male forewing is unique as is the venation in the hindwing. The male genitalia with the simple cerci, tenth tergites, and claspers are most similar to the European and North American species rather than the Asian species in which one or more of these structures are bifid. The venation of the females of most species, including *M. taprobane*, seems to be nearly identical. The genitalia of the female sex in only a few species have been described, but fortunately the geographically closest species,

TABLE 1. Arrangement of larval gills

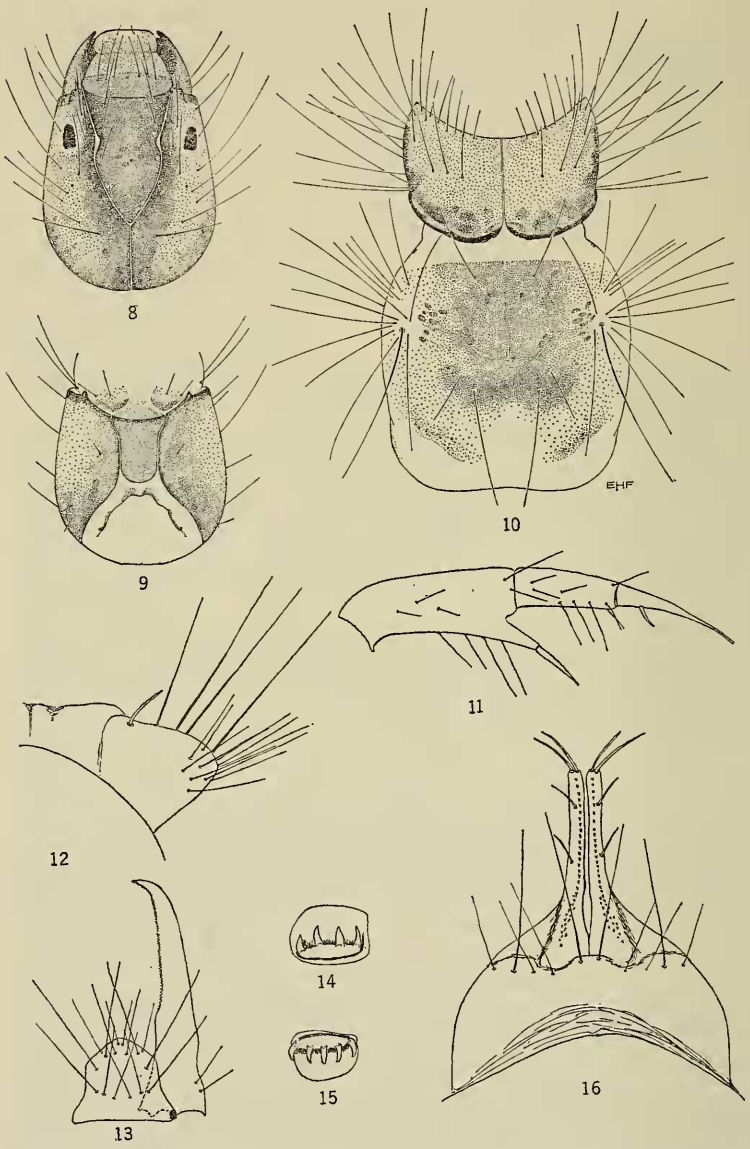
Segment	Dorsal	Lateral	Ventral
1	4		
2	4	1	3
3	4		3
4	3–4		3
5	3–2		3–2
6	2		2
7	2		2
8	2		

M. paramoesta, is well figured (Wiggins 1968, Fig. 3), and clearly differs in the shape of the tenth tergum and vagina.

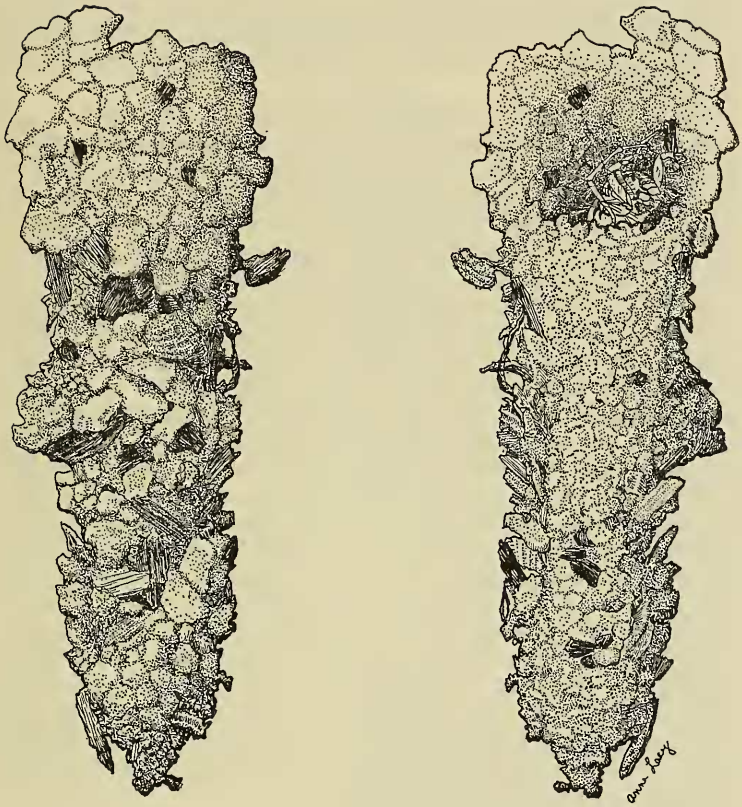
The larvae of a few species are well described, but none of these is a species known from south of the Himalayas. Of the species described all except *M. albicans* Zett. have a color pattern on the head consisting of a nearly black "V" following the epicranial sutures (Lepneva 1971, Sherberger and Wallace 1971). *M. albicans* by lacking the transverse fracture on the mesonotum can be separated from *M. taprobane*. Even fewer pupae than larvae are known in the genus, and none is described completely enough to permit specific recognition. In general, specific characters in the pupal stage are shown most frequently in the number of hooks per plate, in the arrangement of the gills, and in the structure of the apical appendages.

Adult: Length of forewing, 13–14 mm. Color grayish brown; mid and hind legs cinereous; forewing mottled with irregular paler areas. Male with maxillary palpi and foretibia and tarsus densely covered with fuscous hairs; forewing with costal area reflexed onto lower surface and pocket thus formed filled with a pencil of long dark hairs; anal area with scattered, small, dark scales; hindwing with central area bearing long, black hairs concentrated along vein Rs (Fig. 1–2). Male genitalia (Figs. 3–4): Ninth segment typical for genus. Tenth tergum composed of decurved, beaklike lateral plates bearing a small dorsolateral shoulder. Cercus simple, elongate, directed posterodorsally. Clasper elongate, tapering regularly from base to apex, in ventral aspect with a narrow ventral shelf; with a small basomesal process. Aedeagus tubular with a small central sclerite and a number of apical spines. Female genitalia (Figs. 5–7): Eighth sternum simple, posterior margin slightly emarginate mesally. Ninth and tenth segments fused; tenth tergum projecting slightly, posterior margin rounded. Vagina with anterior sclerite bearing a central opening and lateral winglike lobes connecting to several slightly sclerotized folds posteriorly.

Larva: Length to 15 mm. Color of sclerites mostly pale yellowish, marked with brown. Head, pro- and mesonota irregularly clouded with



Figs. 8–16. *Molanna taprobane*, new species: 8, larval head, dorsal; 9, larval head, ventral; 10, larval pro- and mesonotum, dorsal; 11, larval fore tibia, tarsus, and claw; 12, larval left sclerite "B" of anal proleg, dorsal; 13, pupal labrum and mandible, dorsal; 14, pupal hook plate 5



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FIGS. 17–18. *Molanna taprobane*, new species: 17, larval case, dorsal; 18, larval case, ventral (Drawings by Ann Lacy).

brown (Figs. 8–10). Frontoclypeus without enlarged membranous areas at lateral constrictions. Gular sclerite long, widened anteriad (Fig. 9). Mesonotum with transverse and anteromesal fractures (Fig. 10). Base of tibial spur of foreleg extending beyond base of tarsus and with 3 or 4

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posterior, dorsal; 15, pupal hook plate 6 anterior, dorsal; 16, pupal apical processes, dorsal (Drawings 8–10 by Elsie H. Froeschner).

large setae along ventral margin (Fig. 11). Gills generally borne in small groups (Table 1). Eighth segment laterally with 13–16 small bifid processes. Sclerite "B" of anal proleg with a single, posteromesal, pale spine (Fig. 12).

Pupa: Length 15 mm. Mandible and labrum, Fig. 13. Front of head with a small, dark knob and 3 pairs of hairs mesally; with 2 long hairs between base of mandible and eye. Basal segment of antenna with 6–8 setae; antenna reaching to eighth abdominal segment. Fore and midtarsi with lateral hair fringes. Abdominal segments 3–8 with well-developed lateral line fringes, those of segment 8 meeting posteroventrally. Segments 2–8 with strong dorsolateral and ventrolateral, longitudinal, sclerotized bars. Gills present on segments 2–8, apparently similar in arrangement to those on larvae. Segment 1 dorsally with a transverse, arcuate ledge mesally; posterior margin with a broad band of small, posteriorly directed points. Hook plates anteriorly on segments 3–6, each with 4–6 hooks; segment 5 with 4 hooks posteriorly (Figs. 14–15). Apical processes long, rodlike, contiguous; dorsally with an irregular row of points; with a short, pale seta at midlength, another at ¾ length, and 2 apically (Fig. 16).

Case: Length to 30 mm, width to 10 mm. Structure generally typical of *Molanna*, but narrower than usual and generally incorporating much plant matter which often extends loosely from case dorsally and laterally producing a "shaggy" appearance (Figs. 17–18).

Material: Holotype, male: Ceylon, Nuwara Eliya Dist., Horton Plains, 7000 ft. elev., 3–4 Oct. 1970, O. S. Flint, Jr. USNM Type 72828. Allotype: Kandy Dist., Gartmore Dola, 2000 m elev., 29 Nov. 1970, Starmühlner, Vienna Museum. Paratypes: Same data as holotype, 1 ♂. Nuwara Eliya Dist., Pattipola, 6100 ft. elev., 3–6 Oct. 1970, O. S. Flint, Jr., 3 ♂. Other: Same data as holotype, many larvae, 2 pupal exuviae. Same data as Pattipola locality, 5 larvae.

Biology: This species appears to be limited to high elevations in the central mountains of Ceylon: all three localities lie between 6100 and 7000 feet in elevation.

The larvae that were taken at Horton Plains were found in a small, sandy-bottomed pool close to the Belihul Oya. Although the larvae were very abundant, and in all sizes, they were very hard to see because the cases blended in so closely with the bottom. The pool was searched for pupae, and although none was found, 2 pupal exuviae were found floating along the margin of the pool. The two males were taken by net from under the adjacent, overhanging wall of the pit.

The situation at Pattipola was quite different. Here the larvae were found in a stream 2–3 feet wide by only a few inches in depth in riffle areas. However the stream was rather deeply incised into the meadow and had many long pools up to 3 feet in depth where the water flow was very slight. The larvae were found sparingly on the bottom in company with larvae of Lepidostomatidae and Calamoceratidae. The adults at

this locality were probably taken at an ultraviolet light operated close to the stream, but the banks of the stream were also swept with a net and the two collections pooled.

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